ABSTRACT

The present invention aims to achieve accurate measurement and evaluation of mechanical properties of an object to be measured 1 without use of a force sensor. A weight 3 is attached to the object to be measured 1 to form a mass-spring system in which the object to be measured 1 serves as a spring element. Then vibration is applied to the mass-spring system to measure the inertial force acting on the weight 3 and the displacement of the weight 3 so that the mechanical properties of the object to be measured 1 will be evaluated based on the inertial force and displacement. A light wave interferometer 6 measures the displacement velocity of the weight 3 to calculate the inertial force from the acceleration determined by differentiating measured values of the displacement velocity of the weight 3 and calculate the displacement of the weight 3 by integrating the measured values of the displacement velocity of the weight 3.